Evaluation of FY2017 Operating Results for Japan Aerospace Exploration Agency

August 2018

Prime Minister
Minister for Internal Affairs and Communications
Minister of Education, Culture, Sports, Science and Technology
Minister of Economy, Trade and Industry

Form 2-1-1 Japanese Aerospace Exploration Agency/FY2017 Evaluation/Overview of the Evaluation

1. Items related to the evaluation		
Agency	Japan Aerospace Exploration Agency	
FY for evaluation	FY evaluation	FY2017 (3rd term)
	Mid to long-term objective period	FY2013-FY2017

2. Items related to the assessor				
The Competent Minister		Prime Minister		
	Incorporated jurisdiction dept.	National Space Policy Secretariat, Cabinet office	Dept. and person in charge	National Space Policy Secretariat, Cabinet office, Counselor, Hidekazu Takakura
	Evaluation and Inspection dept.	Policy Evaluation Public Relations Division, Minister's Secretariat	Dept. and person in charge	Policy Evaluation and Public Relations Division, Director, Hiroki Kawata
The Competent Minister		Minister for Internal Affairs and Communications		
	Incorporated jurisdiction dept.	Global Strategy Bureau	Dept. and person in charge	Space Communications Policy Division, Director, Satoshi Murakami
	Evaluation and Inspection dept.	Policy Evaluation Public Relations Division, Minister's Secretariat	Dept. and person in charge	Policy Evaluation and Public Relations Division, Nozomu Sugawara
The Competent Minister		Minister of Education, Culture, Sports, Science and Technology		
	Incorporated jurisdiction dept.	Research and Development Bureau	Dept. and person in charge	Space Development and Utilization Division, Director, Naoyuki Fujiyoshi
	Evaluation and Inspection dept.	Science and Technology Policy Bureau	Dept. and person in charge	Policy Evaluation and Public Relations Division, Director, Keiji Inoue
The Competent Minister		Minister of Economy, Trade and Industry		
	Incorporated jurisdiction dept.	Manufacturing Industries Bureau	Dept. and person in charge	Space Industry Office, Office Director, Yousuke Asai
	Evaluation and Inspection dept.	Policy Evaluation Public Relations Division, Minister's Secretariat	Dept. and person in charge	Policy Evaluation and Public Relations Division, Director, Satoshi Miura

3. Items regarding implementation of evaluation
June 29, 2018 Field visit by members of the Sub-Committees on Japan Aerospace Exploration Agency (JAXA) under the Ministry of Education, Culture, Sports, Science and Technology, Ministry of Economy, Trade and Industry and Cabinet Office (JAXA Sagamihara Campus)
July 5, 2018 Hearing about business performance of JAXA by the Cabinet Office
July 9, 2018 Hearing about business performance of JAXA by the Ministry of Education, Culture, Sports, Science and Technology
July 13, 2018 Hearing about business performance of JAXA by the Ministry of Internal Affairs and Communications
July 17, 2018 Hearing about business performance of JAXA by the Ministry of Internal Affairs and Communications
July 18, 2018 Hearing about business performance of JAXA by the Ministry of Education, Culture, Sports, Science and Technology
July 20, 2018 Hearing about business performance of JAXA by the Ministry of Economy, Trade and Industry
August 1, 2018 Hearing in the Sub-Committee on JAXA under the Cabinet Office
August 1, 2018 Hearing in the Sub-Committee on JAXA under the Ministry of Economy, Trade and Industry.
August 1, 2018 Hearing in the Sub-Committee on JAXA under the Ministry of Education, Culture, Sports, Science and Technology
August 3, 2018 Hearing in the Sub-Committee on JAXA under the Ministry of Internal Affairs and Communications
August 10, 2018 Hearing in the National Research and Development Agency Council under the Ministry of Internal Affairs and Communications
August 22, 2018 Hearing in the National Research and Development Agency Council under the Ministry of Education, Culture, Sports, Science and Technology
[Members of Sub-Committee on JAXA, Space Policy Committee under the Cabinet Office: Setsuko Aoki, Member (Professor, Keio University Law School) Kuniaki Tanabe, Ad hoc member (Professor, Graduate School for Law and Politics/Graduate School of Public Policy, University of Tokyo), Noriko Endo, Member (Project Professor, Graduate School of Media and Governance, Keio University), Haruhiko Kataoka, Ad hoc member (ex-Chief of Staff, Air Self Defense Force), Seiko Shirasaka, Ad hoc member (Professor, Graduate School of System Design and Management, Keio University), Toshiko Seki, Ad hoc member (Representative, Value-added

Technology Research Institute), Noriyuki Namiki, Ad hoc member (Professor, National Astronomical Observatory of Japan)]

[Members of Sub-Committee on JAXA, National Research and Development Agency Council under the Ministry of Internal Affairs and Communications: Masahiro Umehira, Member (Professor, College of Engineering, Ibaraki University), Keiko Chino, Member (Senior Staff Writer, Yomiuri Newspaper Tokyo Head Office), Hideki Mizuno, Member (Professor, School of Engineering, Tokai University), Yuta Irisawa, Expert advisor (Partner, Avantia GP), Yumi Ogose, Expert advisor (Professor, Professional Graduate School, Tokyo University of Science), Souichirou Kozuka, Expert advisor (Professor, Department of Law, Faculty of Law, Gakushuin University), Noriharu Suematsu, Expert advisor (Professor, Research Institute of Electrical Communication, Tohoku University), Shinichi Nakasuka, Expert advisor (Professor, School of Engineering, University of Tokyo), Yoshiyuki Fujino, Expert advisor (Professor, Department of Electrical and Electronic Engineering, Toyo University), Masayo Fujimoto, Expert advisor (Affiliate Professor, Institute of Information Security), Ikuko Yairi, Expert advisor (Associate Professor, Faculty of Science and Technology, Sophia University)]

[Members of Sub-Committee on JAXA, National Research and Development Agency Council under the Ministry of Education, Culture, Sports, Science and Technology: Tokuyuki Takahashi, Member (President, Toyofuji Shipping Co., Ltd.), Yoshiko Kojo, Member (Professor, Graduate School of Arts and Sciences, College of Arts and Sciences, University of Tokyo), Seiko Shirasaka, Ad hoc member (Professor, Graduate School of System Design and Management, Keio University), Steve Squyres, Ad hoc member (Professor, Cornell University), Arisa Kuroda, Ad hoc member (CEO, Antares Corporation Co., Ltd.), Yuko Nagahara, Ad hoc member (Deputy Director, Research Center for Science Systems, Japan Society for the Promotion of Science), Masao Hirano, Ad hoc member (Professor, Faculty of Commerce, Waseda University)]

[Members of Sub-Committee on JAXA, National Research and Development Agency Council under the Ministry of Economy, Trade and Industry: Hiroshi Ashibe, Ad hoc member (Advisor, GCA Corporation)
Misuzu Onuki, Ad hoc member (Space Business Consultant, Space Frontier Foundation), Takashi Goto, Member (President and CEO, Seibu Holdings, Inc.)
Tetsuya Sakashita, Ad hoc member (Director, Utilization of Digital Information Research Department, JIPDEC), Yoshiko Taya, Ad hoc member (Professor, Japan Woman's University), Takashi Yoshimura, Ad hoc member (Director, Industrial Technology Bureau, Japan Business Federation)]

4. Important items and others relating to the evaluation
On March 27, 2018, JAXA approved the revision of the mid to long-term plan to specify the use of the supplementary budget for FY2017.

Form 2-1-2 Japan Aerospace Exploration Agency/FY2017 Evaluation/Overall Rating

<table>
<tr><td colspan="8">1. Overall rating</td></tr>
<tr><td rowspan="5">Rating*1
(S, A, B, C, D)</td><td rowspan="5">A</td><td colspan="6">(Reference) Overall rating in the past fiscal years in this mid to long-term objective period*2</td></tr>
<tr><td></td><td>FY2013</td><td>FY2014</td><td>FY2015</td><td>FY2016</td><td>FY2017</td></tr>
<tr><td>Quality improvement business</td><td>A</td><td rowspan="3">A</td><td rowspan="3">B</td><td rowspan="3">A</td><td rowspan="3">A</td></tr>
<tr><td>Efficiency of business operations</td><td>A</td></tr>
<tr><td>Improvement of financial conditions</td><td>A</td></tr>
<tr><td>Reasons for rating</td><td colspan="7">As shown in the overall evaluation of the agency as a whole, the creation of considerable achievements and anticipated creation of achievements in the future and so on were recognized as a result of comprehensive consideration based on circumstances surrounding the agency’s business achievements, efforts and so on through its activities and with the national research and development agency’s mid to long-term objectives taken into account.</td></tr>
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2. Evaluation of the whole agency

At the “Subcommittee on Japan Aerospace Exploration Agency” under the Cabinet Office and the “National Research and Development Agency Council” under the Ministry of Internal Affairs and Communications, the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Economy, Trade and Industry, the work performance details for FY2017, which falls on the fifth fiscal year of JAXA's third mid to long-term objective period, were deliberated in accordance with social insight, scientific knowledge and international standards based on the report for work performance submitted by JAXA, and advice was duly provided.

In FY2017, ratings were steadily improved in all items, in which three items were rated S and 13 items were rated A, and considerable achievements were seen in the item entitled “Maximization of R&D achievements and quality improvement of the other operations” and other items. Therefore, by and large, it is concluded that the progress on performance more than that of the mid to long-term objectives and etc. has been recognized.

Specially noteworthy is that particularly outstanding achievements were recognized in the space transportation system which chalked up a track record of operational performance with the launch of six rockets, the highest number of rockets launched in a fiscal year, while maintaining the world’s highest success rate in the launch and on-time launch, as well as in the aviation science technology with the development of the world’s highest level fuel reduction technique which may lead to the strengthening of international competitiveness of Japan’s aeronautical industry. The creation of outstanding achievements was also recognized in satellite remote sensing and manned space activities, which further promoted the use of satellite data by external organizations mainly for security guarantee and disaster response, and the progress of experiments by the private sector, etc. in “Kibo” (JEM), a Japanese experiment module of the International Space Station. In addition, the promotion of collaboration with private business operators resulted in the success launch of the world’s smallest rocket (SS-520) using commercial technologies and produced achievements to boost the promotion of small rocket business by private business operators in the future, and consistent efforts for increasing space utilization resulting in the massive investment by the Development Bank of Japan (DBJ), etc. to the moon resource exploration venture. These are the achievements may which may largely contribute to accomplishing government objectives set forth in the “Space Industry Vision 2030,” and so on.

Although a legal judgment must be awaited for the bribery allegation by a former executive, if it is true, the deed ruins the credibility of JAXA. Thorough investigation of deficiency in the internal control that failed to prevent criminal act and measures to prevent recurrences are required.

3. Issues to be solved and /or improved for each subject

○ With regard to space transportation system, it is desired to succeed commercial launch service for H3 rocket, which is currently being developed, through further reinforcement of the prime development system and improvements of rocket.

○ With regard to satellite remote sensing, further contribution to the enhancement of the national disaster management system is expected. Strengthening of agency’s leadership in the satellite remote sensing in the entire Asian regions is also expected.

○ With regard to manned space activities, progress is expected so that achievements are produced in the private use of “Kibo” more extensively, scientific outcomes using JEM and spillover effect on the private sector, and development of new HTV, with the cost efficiency always taken into account. It is expected that manned space activities highly valuable for Japan, including the way to engage with international cooperation, are discussed while developments in the U.S. are kept in mind.

○ With regard to strengthening of the research analysis and strategic planning functions, it is desired to continue efforts because the research analysis and strategic planning is a critical function when in-depth strategy is required for space development. ○ With regard to information disclosure and publication, as an increased recognizability has been attained and maintained in this term, it is recommended that JAXA set and promote new public relations objectives to reach the people showing no interest and add them to the indexes besides the recognizability for making a step forward in the next and subsequent terms. ○ With regard to streamlining and efficiency of operations, efforts for reducing general administrative expenses, operating costs and personnel expenditures, etc. have been continued, but ways of streamlining and efficiency of operations, need to be discussed from different perspectives to cope with potential cases which are difficult to respond to in the future, while methods other than cost reduction are sought. ○ With regard to the use of information technology, it is expected JAXA to watch the latest trends of IT continuously, and aggressively introduce technologies and methods useful for improving operational efficiency, etc.

4. Other items	
Major opinions of National Research and Development Agency Committee	○ In the annual plan, not only support or contribution, but specific activities must be contained in the plan. ○ Active advertising activities are desired to accelerate the use of satellite data internationally, particularly in ASEAN. ○ JAXA is expected to investigate into its efforts required for applying newly developed technologies in society and try to make them realize. ○ Governance of the organization, including information management, may become complicated as collaboration with external organizations increases. Sufficient measures should be taken. ○ Planned operations were steadily carried out, and most of the targets achieved. It is highly evaluated that research achievements have been used in the industry as well as flexible responses to changes in the space related industries and environment surrounding JAXA, and achievements of best efforts have been obtained while collaboration with universities and other education and research institutions reinforced insufficiencies in a mutually way.
Auditor's special comments	No special matters to note

*1 S: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts and so on through its activities, especially the creation of considerable achievements, anticipated creation of special achievements in the future and so on toward "maximization of R&D achievements" under the conditions of appropriate, effective and efficient operations are recognized.

A: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts and so on through its activities, the creation of considerable achievements, anticipated creation of achievements in the future and so on toward "maximization of R&D achievements" under the conditions of appropriate, effective and efficient operations are recognized.

B: Based on the National Research and Development Agency's aims, business, mid to long-term objectives and so on, as a result of comprehensive consideration based on some circumstances regarding the agency's business achievement, efforts and others, a certain degree of expectation for the creation of achievement and creation of achievement in the future toward "maximization of R&D achievements" were recognized, and steady business operations have been also recognized.

C: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts and so on through its activities, the creation of achievements, further drastic efforts and improvements toward "maximization of R&D achievements" or "the appropriate, effective and efficient operations" are anticipated.

D: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts and so on through its activities, special efforts and improvements including a fundamental drastic review, toward "maximization of R&D achievements" or "the appropriate, effective and efficient operations" are required.

*2 Evaluations up to FY2013 were not made based on the evaluation committee for incorporated administrative agency under MEXT's jurisdiction, since evaluation was made at each step for the major items of item by item evaluation, this evaluation shall be described in the reference as the previous period's evaluation.

Form 2-1-3 Japan Aerospace Exploration Agency/FY2017 Evaluation/Summary Table for Rating by Item

Mid to long-term objectives (Mid to long-term plan)	FY Ratings					Itemized evaluation document No.	Remarks
	FY2013	FY2014	FY2015	FY2016	FY2017		
I. Maximization of R&D achievements and quality improvement of the other operations							
1. Securing space safety and security							
(1) Positioning satellites	A	B	B	B	B	I-1-1	-
(2) Satellite remote sensing	S	S	B	B	A	I-1-2	-
(3) Satellite communication/ satellite broadcasting	A	B	B	B	B	I-1-3	-
(4) Space transportation systems	S	A	S	S	S	I-1-4	-
(5) Other efforts	-	-	B	B	A	I -1-5	-
2. Promoting space utilization in the private sector							
(1) Positioning satellites	A	B	B	A	B	I-2-1	-
(2) Satellite remote sensing	S	S	A	A	A	I-2-2	-
(3) Satellite communication/satellite broadcasting	A	B	B	B	B	I-2-3	-
(4) Other efforts	-	-	B	B	B	I-2-4	-
3. Maintaining and enhancing the foundations of the space industry and scientific technology							
(1) Space transportation systems	S	A	S	S	S	I-3-1	-

Mid to long-term objectives (Mid to long-term plan)	FY Ratings					Itemized evaluation document No.	Remarks
	FY2013	FY2014	FY2015	FY2016	FY2017		
II. Items concerning the efficiency of the administration of the operations							
1. Enhancement of internal controls and governance			C	A	B	II-1	-
(1) Security of information	A	B					
(2) Project management	A	B					
(3) Appropriateness of contract	A	B					
2. Flexible and efficient organization management	A	B	B	B	A	II-2	-
3. Streamlining and efficiency of operations			B	B	B	II-3	-
(1) Streamlining and efficiency of operational expenses	A	B					
(2) Streamlining and efficiency of personnel expenses	A	B					
4. Application of information technology	S	B	B	B	B	II-4	-
III. Items regarding improvements in financial related matters							
III. Budget (Including personnel expenses)/ income and expenditure plan, and funding plan	A	-	B	B	B	III-VII	Evaluation is made in III. Items regarding improvements in financial related matters.
IV. Limit amount of short-term borrowing	-	-					
V. If the agency has any unnecessary property or any property that is	-	-					

(2) Space science/exploration	A	A	C	A	B	I-3-2	-
(3) Manned space	S	B	A	A	A	I-3-3	-
(4) Space solar power	A	B	B	B	B	I-3-4	-
(5) Measures for strengthening industrial base and science/technology base that support individual projects	-	-	B	A	A	I-3-5	-
4. Aeronautical science and technology			S	S	S	I-4	-
(1) Research and development focused on environment and safety	B	A					
(2) Promotion of usage of aviation aeronautical science and technology	A	B					
(3) Contribution to strengthening technology base and industrial competitiveness	-	-					
5. Cross-cutting issues							
(1) Comprehensive efforts to expand use	A	B	B	B	A	I-5-1	-
(2) Strengthening of research analysis and strategic planning functions	A	B	B	B	B	I-5-2	-
(3) Development of fundamental facilities/equipment	A	B	B	B	B	I-5-3	-
(4) Comprehensive enhancement of domestic	A	A	A	B	A	I-5-4	-

expected to be unnecessary property, a plan for disposal of such property							
VI. If the agency intends to transfer or provide as collateral any important property other than the property provided for in the preceding item, a plan therefor;	-	-					
VII. Purpose of using accumulated profit	-	-					
VIII. Important items related to business management and others							
1. Facilities and equipment related issues	A	B	B	B	A	VIII-1	-
2. Plans for personnel	A	B	A	B	A	VIII-2	-
3. Safety and reliability related issues	A	B	C	B	B	VIII-3	-

	human resource base, promotion of public understanding							
	(5) Realization/enhancement of rule of law in outer space	A	A	A	A	A	I -5-5	-
	(6) Strengthening of international space cooperation	A	A	A	A	A	I -5-6	-
	(7) Promotional activities to meet country infrastructure needs overseas	A	B	A	A	B	I -5-7	-
	(8) Information disclosure and public relations	A	A	A	A	A	I -5-8	-
	(9) Business assessment	A	B	B	B	B	I -5-9	-

* For items that are set to “high” level of importance, a “circle” shall be marked next to each comment.
For items that are set to “high” level of difficulty, each comment shall be underlined.

* Ratings up to FY2013 were made based on the “Basic Guidelines for Evaluation of Operational Results for Incorporated Administrative Agencies under the Jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology” (decided by the Evaluation Committee for Incorporated Administrative Agencies, Ministry of Education, Culture, Sports, Science and Technology on March 22, 2002).
Ratings after FY2014 are made based on the “Guidelines for Incorporated Administrative Agency Evaluation)" (Decision by the Minister for Internal Affairs and Communications on September 2, 2014). The details are as follows:

Ratings up to FY2013	Ratings after FY2014
S: Outstanding achievements are fulfilled (Without providing a cross-cutting objective standard for the agency in advance, S is rated according to the characteristics of the agency's business operations.). A: Achievements are in line with the medium-term plan, or beyond, or are steadily being implemented toward a medium-term objective, or beyond (achievement rate for a medium-term plan should be over 100% in a given FY.). B: In some ways the plan is not being implemented in line with medium-term plan, however, a medium-term objective may be achieved by means of ideas and efforts (achievement rate for the medium-term plan should be 70% to 100%.). C: The implementation of the plan is behind the medium-term objective, therefore, improvement of business is necessary in order to realize the achievement of the medium-term objective (achievement rate for the medium-term plan in a given FY is less than 70%). F: The Evaluation Committee needs to warn an agency concerning the improvement of its business management and others (Without providing an objective standard in advance, F is rated as a result of judgment that a warning concerning business improvement is necessary.).	[Administrative and projects related to research and development (I)] S: Based on the National Research and Development Agency’s aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency’s business achievements, efforts and so on through its activities, especially the creation of considerable achievements, anticipated creation of special achievements in the future and so on toward “maximization of R&D achievements” under the conditions of appropriate, effective, and efficient operations are recognized. A: Based on the National Research and Development Agency’s aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency’s business achievements, efforts and so on through its activities, the creation of considerable achievements, anticipated creation of achievements in the future and so on toward “maximization of R&D achievements” under the conditions of appropriate, effective, and efficient operations are recognized. B: Based on the National Research and Development Agency’s aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency’s business achievement, efforts and so on through its activities, a certain degree of expectation for the creation of achievement and creation of achievement in the future toward “maximization of R&D achievements” were recognized, and steady business operations have been also recognized. C: Based on the National Research and Development Agency’s aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency’s business achievements, efforts and so on through its activities, the creation of achievements, further drastic efforts and improvements toward “maximization of R&D achievements” or the “appropriate, effective, and efficient operations” are anticipated. D: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts through its activities, special efforts and improvements including a fundamental drastic review, toward “maximization of R&D achievements” or the “appropriate, effective, and efficient operations” are required.

	[Other than administrative work and projects regarding research and development (After II)] S: Based on the activities of a corporation, remarkable performance exceeding the intended objectives is recognized quantitatively and qualitatively in the mid to long-term plan (in terms of quantitative indicators, 120% or more vis-à-vis planned mid to long-term values (or planned FY value), and remarkable performance is also recognized qualitatively. A: Based on the activities of a corporation, remarkable performance exceeding the intended objectives is recognized in the mid to long-term plan (in terms of quantitative indicators, 120% or more vis-à-vis planned mid to long-term values (or planned FY value). B: Performance exceeding the intended objectives is recognized in the mid- to long-term plan (in terms of quantitative indicators, 100% or more but less than 120% vis-à-vis planned mid to long-term values (or planned FY value). C: Performance falls below the intended objectives in the mid- to long-term plan, requiring improved performance (in terms of quantitative indicators, 80% or more but less than 100% vis-à-vis planned mid to long-term values (or planned FY value). D: Performance falls below the intended objectives in the mid to long-term plan, requiring drastic improvement of business including its abolishment (in terms of quantitative indicators, less than 80% vis-à-vis planned mid to long-term values (or planned FY value), or it is recognized that the competent Minister is required to make an order for improving business operation or taking other necessary measures).